

WHAT IS CLAIMED IS:

1. A packet relay apparatus for relaying packets between a node and an IP network, said apparatus
5 comprising:

a class processing unit arranged to classify send packets to be relayed to said IP network depending on the types of applications, said class processing unit making allocation of different virtual IP addresses on
10 a class by class basis;

a send packet relay unit arranged to translate source addresses of said send packets to be relayed to said IP network into virtual IP addresses on a class by class basis, said send packet relay unit establishing
15 IP communication paths on a class by class basis in said IP network; and

a reply packet relay unit arranged to inversely translate destination addresses of reply packets from said IP network passing through said IP communication paths on a class by class basis into original addresses
20 by reference to the results of address translation effected by said send packet relay unit.

2. The apparatus according to claim 1, further
25 comprising:

a class table having packet header information entered therein correspondingly to class names defining

the types of said applications;

an address translation rule table having virtual IP addresses and path information entered therein correspondingly to said classes; and

5 an address translation table having therein entered the results of address translation from said packet source addresses to said virtual IP addresses; and wherein

10 said send packet relay unit upon receipt of a send packet to said IP network refers to said address translation table to retrieve a source virtual IP address, said send packet relay unit if there is no entry in said address translation table determining a class by reference to said class table and thereafter referring 15 to said address translation rule table to retrieve a virtual IP address corresponding to said class, said send packet relay unit translating a send packet source address into said retrieved virtual IP address to enter the result of said address translation into said address 20 translation table, and wherein

said reply packet relay unit upon receipt of a reply packet from said IP network refers to said address translation table to retrieve a destination address corresponding to a destination virtual IP address, said 25 reply packet relay unit inversely translating said destination virtual IP address of said packet into said retrieved destination address.

3. The apparatus according to claim 2, wherein
said class table has protocol types, send packet
source addresses and port Nos. and reply packet source
addresses and port Nos. entered correspondingly to said
class names, and wherein

said class retrieval unit retrieves a class from
a combination of a protocol type of a send packet to be
relayed to said IP network and a port No.

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4. The apparatus according to claim 3, wherein
said class table has class names of a business
application entered in the form of combinations of send
packet TCP protocols and port Nos., said class table
15 having all of the combinations of the other protocol
types of said send packets and source port Nos. entered
by class names of a default application.

20 5. The apparatus according to claim 2, wherein
said address translation rule table has virtual
IP addresses and gateway MAC addresses entered
correspondingly to class names entered in said class
table, and wherein

25 said send packet relay unit retrieves a virtual
IP address and a gateway MAC address corresponding to
a class name retrieved from said address translation rule
table.

6. The apparatus according to claim 2, wherein
said address translation table has pre-
translation source addresses and port Nos. and post-
5 translation virtual IP addresses and port Nos. entered
correspondingly to protocol types, and wherein
said send packet relay unit translates a send
packet source address into a virtual IP address retrieved
from said address translation rule table or said address
10 translation table, said send packet relay unit
translating a destination MAC address into a gateway MAC
address retrieved from said address translation rule
table, and wherein
said reply packet relay unit inversely
15 translates a destination virtual IP address received
from said IP network into a pre-translation source
address retrieved from said address translation table.

7. The apparatus according to claim 2, further
20 comprising:

a communication path validation unit arranged
to make a periodical validation of communication through
a communication path of said IP network by use of said
virtual IP address.

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8. The apparatus according to claim 7, wherein
said communication path validation unit when

detecting an abnormal of said communication path prohibits a retrieval of a class that uses said communication path, to make a changeover to use of a default communication path.

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9. The apparatus according to claim 8, wherein said class table includes a status indicative of usable or unusable, and wherein said communication path validation unit when detecting an abnormal of said communication path sets unusable in said status of said class table to prohibit a class retrieval.

10. A method of relaying packets between an inside node and an outside IP network, said method comprising the steps of:

classifying send packets to be relayed to said IP network, depending on the types of applications, to allocate a different virtual IP address to each class; translating source addresses of said send packets to be relayed to said IP network into virtual IP addresses on a class by class basis to establish IP communication paths on a class by class basis in said IP network; and inversely translating destination addresses of reply packets from said IP network passing through said IP communication path on a class by class basis into

original addresses by reference to the results of address translation in said send packet relaying step.